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MORTALITY AS AN INDICATOR OF ECONOMIC SUCCESS AND FAILURE*

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Quality of life depends on various physical and social conditions, such as the epidemiological environment in which a person lives. The availability of health care and the nature of medical insurance—public as well as private—are among the important influences on life and death. So are other social services, including basic education and the orderliness of urban living, and the access to modern medical knowledge in rural communities. The statistics on mortality draw our attention to all these policy issues. Mortality information can throw light also on the nature of social inequalities, including gender bias and racial disparities.

I feel most honoured to have this opportunity of giving the first Innocenti Lecture. UNICEF's record of dedicated and constructive work—serving the world's neediest children—through imaginative, well-reasoned and effective programmes has earned much-deserved admiration across the world. It is also a pleasure to give this lecture in the great city of Florence, and specifically in this wonderful building, with its own distinguished history.

The occasion, nevertheless, is also a sad one for me. Since the time this lecture was arranged, we have lost James Grant, the great leader of UNICEF, who earned the admiration of everyone who knew him personally, or also of those who knew him through his work—his outstanding and momentous accomplishments. Jim was a deeply inspiring figure for us all.

Personally, I remember receiving very warm encouragement from James Grant almost two decades ago when I was trying to study famines and general economic and social deprivation. The last time I saw him was at a meeting at Harvard less than a year ago—it was a meeting to honour him. He was already very ill, but in his reply to the celebratory speeches, Jim managed to communicate much optimism about the world—a reasoned optimism that had never deserted him right from the time he had first identified how terrible the world was, how it needed changing, and how that change could actually be brought about. We shall miss him always, but we

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can honour him most by continuing to pursue and support the work he had so robustly begun.

The terribleness of the state of affairs that James Grant had identified is not primarily that of 'poverty' defined in terms of just low income. There is, of course, plenty of that in the world in which we live. But more awful is the fact that so many people—including children from disadvantaged backgrounds—are forced to lead miserable and precarious lives and to die prematurely. That predicament relates in general to low incomes, but not just to that. It also reflects inadequate public health provisions and nutritional support, deficiency of social security arrangements, and the absence of social responsibility and of caring governance. A massive change can be achieved through well thought out programmes of public intervention, through international as well as national efforts, and this can bear fruit even before the general level of income can be radically raised. It was this combination of optimism and realism that led Jim Grant to organise public action and international programmes to reduce preventable morbidity, avoidable undernourishment, and unnecessary mortality. The successes achieved have been far-reaching and magnificent.

In the process of this intensely practical work, Grant also provided an effective reorientation of the concept of poverty. Instead of conceiving it in terms of the cold and often inarticulate statistics of low incomes, he saw poverty in the light of the directly relevant and immediately gripping facts of diminished lives, agonised existence, and untimely deaths. That is a real shift in perspective. This lecture is partly an attempt to explore that penetrating approach somewhat more explicitly.

Elsewhere (Sen, 1980; 1985*a*, *b*; 1987*a*; 1992*a*) I have tried to argue that in judging a person's advantage and deprivation, we have to shift our attention from an exclusive concentration on incomes and commodities (often used in economic analyses) to things that people have reason to value intrinsically. Incomes and commodities are valued mainly as 'instruments'—as means to other ends. We desire them for what we can do with them; possessing commodities or income is not valuable in itself. Indeed, we seek income primarily for the help it might provide in leading a good life—a life we have reason to value. This suggests a case for concentrating on characteristics of living, which—as Aristotle had analysed (in the *Nicomachean Ethics* as well as in *Politics*)—consists of specific functionings: what we can *do* and *be*. Since an increase in income from very low levels would help a person to be well nourished, rather than being hungry and deprived (and possibly dead), a higher income would be instrumentally valued. On the other hand, being able to avoid starvation, hunger and premature death is valued for its own sake. This alternative perspective suggests that, in assessing advantage and disadvantage, we should look at people's ability to do and be what they have reason to value—the 'capabilities' of each person. The 'capability perspective' leads to a very different empirical focus from what we get from the more orthodox concentrations in the literature of poverty and welfare economics, since low personal income is only one of the factors that influence the deprivation of

basic capabilities.[1] The approach underlying Jim Grant's work has some similarity with this perspective, though his strategy was grounded not so much on foundational theory, but on practical reason with immediate applicability.[2]

1. Counter-questions

We can begin with the question: why should—or how could—mortality be an indicator of economic success? Mortality statistics, it could be suggested, belong to the territory of the demographer, not of the economic analyst.[3] Economics is not about mortality. Is there a 'category mistake' here?

Certainly, mortality is not in itself an economic phenomenon. But the connection lies in the fact that the influences that increase or reduce mortality often have distinctly economic causes, and there is thus a *prima facie* reason for not dismissing mortality as a test of economic performance. This is where we must begin, but in order to go beyond this *prima facie* thought, we have to address some specific questions that may be used to dispute this view. I shall identify the following queries as possible starting points of this dialectical inquiry.

(1) Why is the reduction of mortality so important? What about other objectives? Why not look at all the valuable capabilities, not just the achievement of escaping mortality?

(2) Even if we want our policy analysis to be informed by considerations of mortality and morbidity, why can we not concentrate on those aspects of economic performance (such as the national income and its distribution, and the level of poverty) which relate directly to such matters as morbidity and mortality, rather than going 'overboard' to take on mortality itself to be a criterion of economic performance?

(3) Would it not be better to look at morbidity rather than mortality since the suffering of people relates to illness, and once dead, there are—we presume—no further pains?

(4) Even if mortality is the right thing to look at, surely it is too sluggish a variable to be of much use as an economic indicator, since we need a focal variable that is sensitive and quick to respond, permitting us to adjust economic policies in time?

These are serious and challenging questions, and I should put in an effort to answer them.

[1] The rationale underlying the use of the capability perspective, and the technical and measurement issues raised by it, are discussed in Sen (1980; 1985*a*; 1987*a*; 1992*a*). See also related investigations in Streeten *et al.* (1981), Stewart (1985), Roemer (1986), Erikson and Aberg (1987), Drèze and Sen (1989), Griffin and Knight (1990), UNDP (1990), the special number (with contributions by G. A. Cohen, Philippe Van Parijs and others) of *Recherches économique de Louvain*, vol. 56 (1990), Crocker (1991), Desai (1991), Anand and Ravallion (1993), Nussbaum and Sen (1993), Herrero (1995), and Streeten (1995), and the symposia on the capability perspective, edited respectively by Lenti (1995) and Balestrino and Carter (1997), among other contributors.

[2] Grant (1978) discusses his motivations and the connection between theory and application. See also Morris (1979) and Erikson and Aberg (1987).

[3] I have discussed the connection between the two territories in Sen (1995).

2. What Is So Significant about Mortality?

It is true that we do tend to take for granted the so-called 'human predicament' and do not constantly pine for immortality. While some of us may be imprudent enough to think that immortality might have been rather agreeable, others seem to have come to accept it as not only unattainable, but possibly not all that nice either. 'When I catch myself resenting not being immortal,' confessed Arnold Toynbee (1969), 'I pull myself up short by asking whether I should really like the prospect of having to make out an annual income-tax return for an infinite number of years ahead.' Perhaps there might be even greater hazards in living in perpetuity than filling up infinitely many income tax forms (even though in the political climate of today's United States, this is not an easy thought). But of course immortality is not an option, and the issue is the difference between living *long* or *short*, and in particular the difference that is made by the possibility of dying prematurely, at a comparatively young age.

There can be little doubt that living long is a much shared aspiration. Even though it is clearly not the only thing we seek, a long life is *inter alia* fairly universally valued—and valued very strongly. This is not only because living as a state of being is itself valued, but also because it is a necessary requirement for carrying out plans and projects that we have reason to value. The dead cannot do much. As Andrew Marvell told his 'coy mistress,' more than three centuries ago:

> The grave's a fine and private place,
> But none, I think, do there embrace.

I don't know how 'coy' Marvell's mistress was, nor what importance 'embracing' had in Marvell's life, but he was certainly right to think that we value life because of the things we can do, if alive. The value of living must reflect the importance of the diverse capabilities for which it is a necessary requirement.

The big changes in mortality that are continuing to occur across the world does not involve extending lives to unimaginable lengths, but relate to the saving of premature mortality—of infants, children, and young or middle-aged adults. *Ecclesiastes* might have been right to argue that there is 'a time to be born, and a time to die', but so many of the preventable deaths in fact occur—as Jim Grant knew so well—much before that 'time to die'.

This is not to deny that there could well be good grounds for a person to seek to terminate his or her own life (for example, when the person is in massive pain and suffering, with no chance of recovery), but those who are less ill and less miserable also tend typically to live rather longer. So the extension of life expectancy is not only, typically, valuable for its own sake, but also for its *associated* characteristics (such as the lowering of morbidity).

I shall have to come back, presently, to the relation between mortality and morbidity, but the general point about associated features also apply to other correlates of mortality, even those variables such as adult literacy, female education, birth rate, fertility rate, and so on, that are not as directly linked to

mortality as morbidity is.[4] The point here is not so much to argue that life expectancy can adequately represent these other achievements as well, but only that there might often be relatively limited tension between the virtue of raising life expectancy and many other elementary accomplishments central to the process of development. This does not deny the possibility of potential conflict between longevity and other constitutive elements of the quality of life, but the extent of that conflict is greatly moderated by the positive relations among several of the most basic capabilities.

These causal and associative connections are important to note, since mortality data are more readily available than information on many other types of related achievements. In the practical context, this can be a very important consideration, and it no doubt partly motivated James Grant's powerful and poignant use of mortality information (even though he also utilised other data which were obtainable, such as the frequency of preventable illness and undernourishment). The significance of mortality information lies, therefore, in a combination of considerations, including (1) the intrinsic importance we attach—and have reason to attach—to living, (2) the fact that many other capabilities that we value are contingent on our being alive, and (3) the further fact that data on age-specific mortality can, to some extent, serve as a proxy for associated failures and achievements to which we may attach importance.

3. Why Not Just the Economic Variables?

It is certainly true that mortality rates are affected by poverty and economic deprivation. Personal income is unquestionably a basic determinant of survival and death, and more generally of the quality of life of a person. Nevertheless, income is only one variable among many that affect our chances of enjoying life, and some of the other variables are also influenceable by economic policy.

The gross national product per head may be a good indicator of the average real income of the nation, but the actual incomes enjoyed by people will depend also on the distributional pattern of that national income. Also, the quality of life of a person depends not merely on his or her personal income, but also on various physical and social conditions. For example, the epidemiological atmosphere in which a person lives can have a very substantial impact on morbidity and mortality. The availability of health care and the nature of medical insurance—public as well as private—are among the important influences on life and death. So are the other social services, including basic

[4] For example, for the group of 88 'low-income' and 'lower middle-income' countries, as defined by the World Bank (in its *World Development Report* 1994), the rank correlation of life expectancy is:

0.86 with adult total literacy,
0.82 with adult female literacy,
0.88 with the lowness of the birth rate,
0.89 with the lowness of the fertility rate, and
0.95 with the 'Human Development Index' (of the UNDP) which includes several variables other than life expectancy.

These results are based on data presented in the *World Development Report* 1994, and *Human Development Report* 1994.

education and the orderliness of urban living and the access to modern medical knowledge. There are, thus, many factors not included in the accounting of personal incomes that can be importantly involved in the life and death of people. The point is not the irrelevance of economic variables such as personal incomes (they certainly are not irrelevant), but their severe inadequacy in capturing many of the causal influences on the quality of life and the survival chances of people.

4. Growth of GDP per Head and Life Expectancy in Britain

To illustrate, consider Fig. 1, which presents the decadal growth of real gross domestic product per capita in the United Kingdom for each of the first six decades of this century, and also the decadal increases in life expectancy at birth for each of these six decades for England and Wales.[5] There are two quite remarkable features of these life expectancy experiences. The first is that the pattern of life expectancy increase is almost exactly the opposite of the expansion of gross domestic product per capita. Whatever might have led to the high achievements in some decades, it was not faster economic growth in those decades. It is, of course, possible to suggest that the explanation lies in a

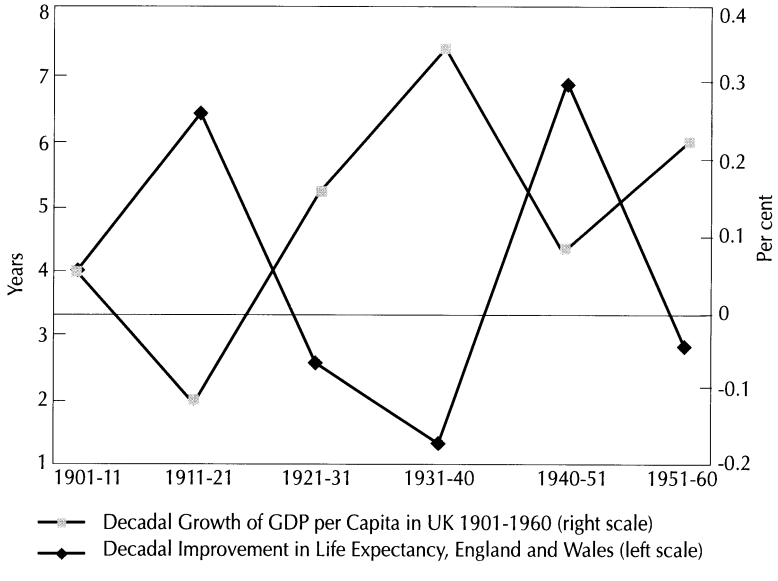

Fig. 1. *Decadal growth of real per capita GDP (UK) and decadal increases in life expectancy at birth (England and Wales), 1901–1960.*
Sources: the growth figures are from Madison (1982) and the life expectancy information is from Preston *et al.* (1972).

[5] The life expectancy figures relate to England and Wales, rather than the United Kingdom as a whole, but England and Wales do form the bulk of the UK population. Also the decade counts for life expectancy involve 1940 and 1960 (rather than what would have been the normal census years of 1941 and 1961). On this contrast, see also Drèze and Sen (1989).

lagged relation, so that increases in GDP per head in one decade can be seen as determining the correspondingly life expectancy advances in the next decade. This possibility cannot be ruled out on the basis of these figures alone, but it is in fact not very consistent with other information we have about the relation between income changes and mortality rates.

Interesting light on the movements of longevity increases is provided by the events of the respective decades. For this, it may be helpful to look at Fig. 2. Life expectancy increases are fairly moderate (between one to four years

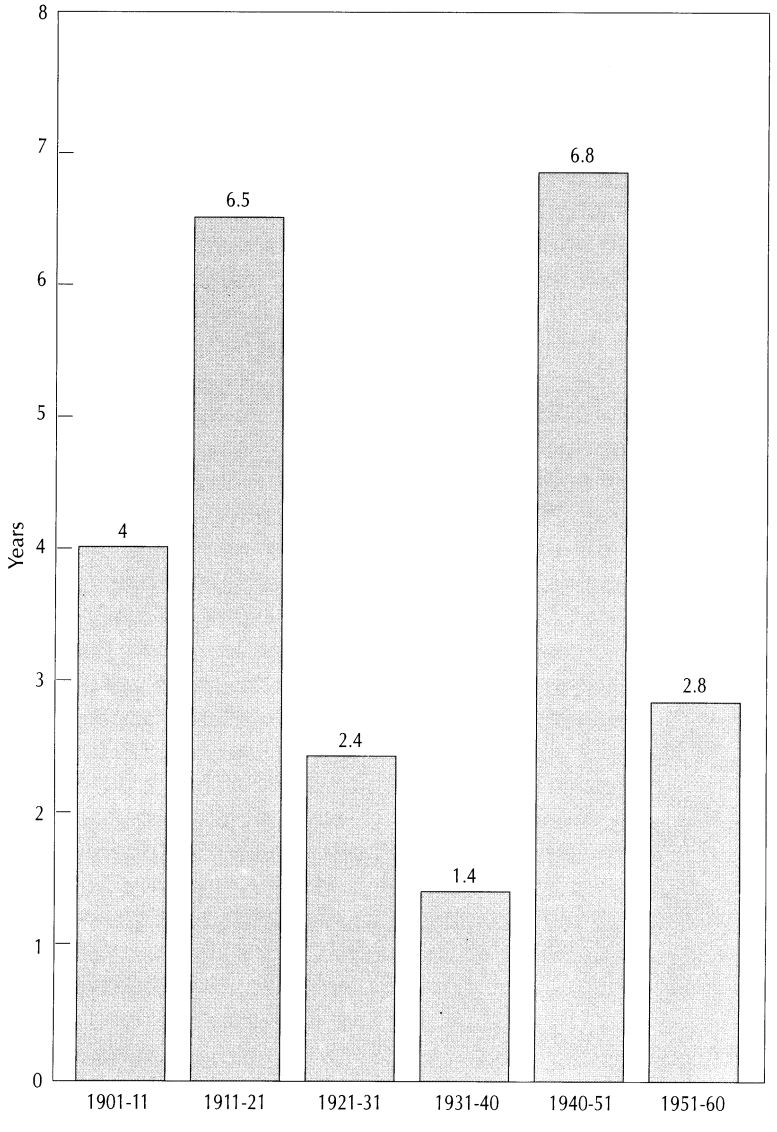

Fig. 2. *Improvements in life expectancy in England and Wales, 1901–1960.* *Source:* see Preston *et al.* (1972), Fig. 1.

added) for each decade, *except for* the decades of 1911–21 and 1941–51, when life expectancy jumped up by nearly seven years per decade. These were, as we know, the war decades. Life expectancy at birth could scarcely have gone up because of the wars themselves. Of course, the life expectancy figures at the beginning and at the end of each decade do not reflect war mortality, since they are calculated in terms of age-specific death rates at the *point* of observation, that is, 1921 and 1951 at the end of the war decades. The question is: why did the age-specific death rates fall so fast between the beginning and the end of the war decades?

The explanation, as I have tried to discuss elsewhere (Sen, 1987*b*; Drèze and Sen, 1989), almost certainly lies in the improvement in public delivery of food and health services over these decades, contingently associated with the war efforts. While the total supply of food per head went down in war time, the incidence of bad undernutrition also *declined* because of the more effective use of public distribution systems associated with war efforts and more equal sharing of food through rationing systems.[6] The National Health Service also emerged in Britain in the decade 1941–51. It is also possible, as Jay Winter (1985) has argued, that there was more of a spirit of sharing in the war years, and more cooperative actions could occur in such periods. So we are looking at influences on mortality rates that concern economic organisation and social environment rather than only the average level of real income per head.

5. Income and Life Expectancy: Cross-sectional Comparisons

Fig. 2 can, of course, give the impression that economic growth is bad for life expectancy, and this contrary thought must also be eschewed. In fact, there is plenty of evidence that life expectancy increases are typically positively associated with economic growth, *given other things*, but these other things are also matters of economic policy and thus need to be considered in policy decisions. In Drèze and Sen (1989),[7] we distinguished between two types of successes in rapid reduction of mortality, which we called respectively 'growth mediated' and 'support-led' processes. The former works mainly *through* fast economic growth, well exemplified by mortality reduction in, say, South Korea or Hong Kong. Its success depends on the growth process being wide-based and participatory (employment orientation has much to do with this), and also on the resources generated by economic growth being utilised to expand the relevant social services (often in the public sector), particularly health care and eduction.

In this context, it is worth mentioning a statistical relation for which Sudhir Anand and Martin Ravallion (1993) have found considerable evidence. They find, on the basis of intercountry comparisons, that life expectancy has a significantly positive relation with GNP per head, but that the relationship works mainly through the impact of GNP on (1) the incomes specifically of the poor, and (2) public expenditure, specifically on public health. In fact, once

[6] See also Titmuss (1950), Hammond (1951), Winter (1986), and Drèze and Sen (1989).
[7] See particularly Chapter 10.

these two variables are included in the statistical relation, the connection between GNP per head and life expectancy altogether vanishes. This does not, of course, imply that life expectancy is not enhanced by the growth of GNP per head, but it does indicate that the connection works through public expenditure on health care, and poverty removal. It also helps to explain why some countries such as South Korea and Hong Kong have been able to raise life expectancy so rapidly through economic growth (with the fruits of growth being shared widely through its participatory character—related partly to the employment-oriented nature of that growth—and through using the resources generated to expand health care), while others—such as Brazil—have been more sluggish in expanding life expectancy, despite their rapid rates of economic growth.

In contrast with the 'growth-mediated' mechanism, the 'support-led' process does not operate through fast economic growth. It is well exemplified by countries such as Sri Lanka, pre-reform China, Costa Rica, or the Indian state of Kerala, which have had very rapid reductions in mortality rates, without much economic growth. This is a process that does not wait for dramatic increases in per-capita levels of real income, and it works through priority being given to providing social services (particularly health care and basic education) that reduce mortality and enhance the quality of life.

But how can the 'support-led' process work in poor countries, since resources are surely needed to expand public services, including health care and education? Where is the money to come from? In fact, this process is viable despite the poverty of the low-income countries precisely because the relevant social services (such as health care and basic education) are very labour intensive, and thus are relatively inexpensive in poor—and low-wage—economies.[8] A poor economy may have less money to spend on health care and education, but it also needs less money to spend to provide the same services that would cost much more in richer countries. Relative prices and costs are important parameters in determining what a country can afford, given an appropriate political commitment.

It is, in this context, also important to note that despite the general connection between real income per head and life expectancy, which is reflected in many inter-country comparisons, there are significant gaps in that relationship. Fig. 3 compares the GNP per head and life expectancies of a few selected economies. It is quite striking that the populations of Sri Lanka, China and the Indian state of Kerala enjoy much higher longevities than do the people of South Africa, Brazil and Gabon, despite the GNP per head of the latter economies being many times those of the former group. The former economies exhibit successes of economic organisation of a kind that is not seen in the latter countries. These contrasts are of considerable policy relevance, and bring out the importance of the 'support-led' (rather than the 'growth-mediated') process.

[8] The underlying issues, including the relevance of relative prices, have been discussed in Drèze and Sen (1989).

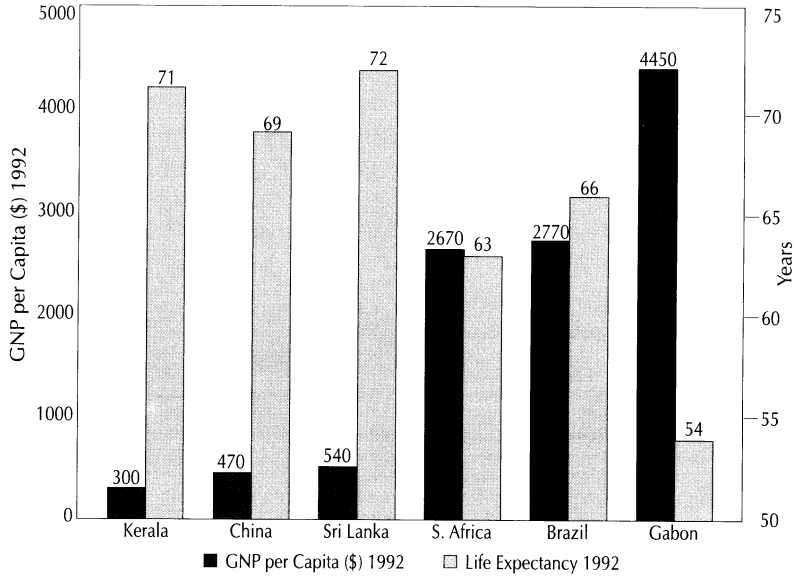

Fig. 3. *GNP per capita (in US$) and life expectancy at birth in selected countries, 1992.*
Source: World Development Reports (World Bank) and *Human Development Reports* (UNDP).

6. Gender Inequality and Differential Mortality

The existence of a strong gender bias against women (and against young girls in particular) has been much discussed in the development literature.[9] Gender bias is, however, very hard to identify, since many of the discriminations are subtle and covert, and lie within the core of intimate family behaviour. Mortality information can be used to throw light on some of the coarsest aspects of gender-related inequality. Indeed, even the simple statistics of the ratio of women to men in the total population can provide insights into the long-term discrimination against women in many societies.

It is often assumed that there must be more women than men in the world, since that is the case in Europe and North America, which have a female to male ratio of 1.05 or so, on the average. In fact, there are only about 98 women per 100 men in the world as a whole. This 'shortfall' of women is most acute in Asia and North Africa. For example, the number of females per 100 males in the total population is 97 in Egypt and Iran, 95 in Turkey, 94 in China, 93 in India, 92 in Pakistan, and 84 in Saudi Arabia (though the last ratio is somewhat reduced by the presence of male migrant workers from elsewhere who come to Saudi Arabia). Fig. 4 presents the female-male ratios in different regions of the

[9] One of the classic contributions on this is Boserup (1971). I have tried to discuss the main issues as well as parts of the extensive literature in Sen (1990); see also Drèze and Sen (1989, 1995). The literature on this is quite vast by now, but an idea of the main lines of argument can be found from Loutfi (1980), Buvinic *et al.* (1983), Bardhan (1984), Jain and Banerjee (1985), Sen and. Sen (1985), Chen (1986), Das Gupta (1987), Basu (1992), Folbre *et al.* (1992), United Nations ESCAP (1992), Dasgupta (1993), and Agarwal (1995).

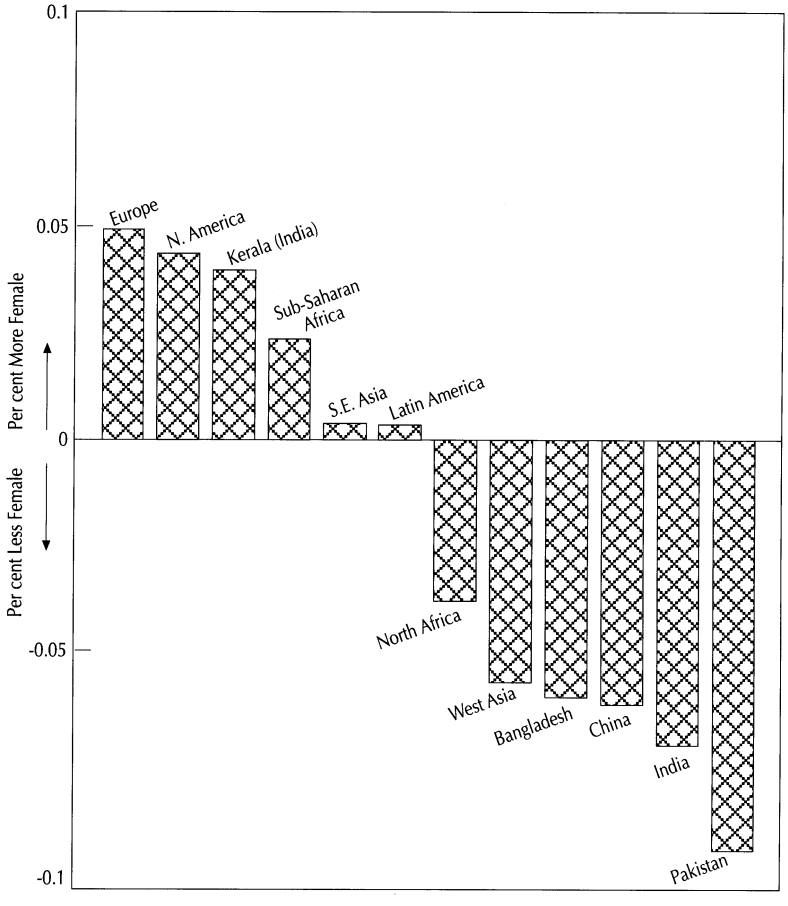

Fig. 4. *Female–male ratios in total population.*
Source: Sen (1993*a*) and the data sources cited there.

world, and it can be seen how variable they are. Differential mortality rates of females and males—now and in the past—do have much to do with these differences in the 'sex ratio' of the population.

Given similar health care and other forms of attention, women tend to have a lower mortality rate than men do at nearly all age groups. This seems to have a biological basis (even female foetuses have a lower probability of miscarriage than male foetuses), though the differential is some times increased by social influences, for example, the higher propensity of men to die from violence, and until recently, the higher tendency of men to smoke compared with women. Everywhere in the world, more male babies are born than female babies (this may be, to some extent, nature's way of compensating for lower survival chances of males), but the proportion of males goes on falling as we move to higher and higher age groups, due to greater male mortality rates. The excess of females over males in the population of Europe and North America results mainly from the greater survival chance of females, though this

excess has been fed, to some extent, also by greater male mortality in the past wars involving the European people (principally the second world war), and north American population (mainly the wars in Korea and Vietnam).

However, because of 'gender bias' against women in many parts of the world, women receive less attention and care than men do, and particularly girls often receive very much less support than boys. As a result, the mortality rates of females often exceed those of males in these countries. The variations of female–male ratio in Fig. 4 largely reflect these differences operating for a long time.[10]

To get an idea of the magnitude of the phenomenon, it is possible to calculate, through one of several methods, the number of 'missing women' as a result of differential elevation of female mortality, related to gender bias.[11] In principle, the concept of 'missing women' is an attempt to quantify the difference between the actual number of women in these countries compared with the number we might expect under no gender bias. For example, if we take the ratio of women to men in sub-Saharan Africa as the standard (there is relatively little gender bias in terms of health care and social status in sub-Saharan Africa), then that ratio of 1.02 can be used to calculate the number of missing women in women-short countries. Other standards can also be used, and more ambitiously, it is possible to make some guess of the likely decrease in age-specific mortality rates of women had they received the same care as men do. The techniques of estimation can vary, but the basic motivation is to get an idea of the numerical significance of the shortfall of women because of gender asymmetry, given by the difference between (1) the number of women we could expect to see in that country in the absence of gender bias in matters of life and death (on specified 'counterfactual' assumptions), and (2) the actual number of women in that country (as observed).

For example, with China's female–male ratio of 0.94, there is a total difference of 8 per cent (of the male population) between that ratio and the sub-Saharan standard used for comparison, viz. 1.02. Taking the total population of China as 1,162 million in 1992, there are about 563 million females and 599 million males. The number of 'missing women' would then be 8 per cent of the male population of 599 million. This gives us a figure of 48 million missing women in China in 1992.[12]

[10] Note must, however, be taken also of the fact that (1) countries with higher longevity would tend to have, given other things, somewhat higher ratio of females (since women's survival advantages accumulate over the life time), (2) greater male mortality in wars has some effect on these ratios, and (3) the 'sex ratio' at birth tends to vary a little over the different regions (for example, the excess of males at birth seems to be rather less in sub-Saharan Africa than in Europe and Asia).

[11] On this see Sen (1985*a*; 1992*b*). See also Kynch (1985), Drèze and Sen (1989), Ch 4, Coale (1991), and Klasen (1994).

[12] See Drèze and Sen (1989). Other techniques can also be used to do this calculation, some involving use of historical information. Age-specific mortality rates can be obtained from historical data—perhaps from 19th century Europe—to get some idea of the excess of female mortality because of gender bias in health and other care in Asia and north Africa today. On this see Coale (1991), and Klasen (1994). While the use of the sub-Saharan African ratio yields a total number of missing women in the world that exceeds a hundred million, Coale's and Klasen's estimates give figures around 60 million and 90 million respectively. These are, in any case, very large figures, and the rankings of countries in terms of the proportion of missing women are rather similar under the different procedures.

The stark statistics of dramatically large numbers of 'missing women', and of the variations in female–male ratio in different parts of the world, draw our attention irresistibly to the need to address the causation of this process. The immediate reason is, of course, the neglect of the interests of women (in health, education, and other means of good living) in allocating care in the family and in the society. But what causes that relative neglect? Some see this as resulting from a lower 'bargaining power' of women in family arrangements, and some would trace that difference—all the way—to organisation in very primitive societies which, it is argued, attached a lot of importance to physical strength and to the ability to hunt and gather food from outside. Others want to take account of the greater vulnerability that arises due to pregnancy and nurturing of babies.

None of these explanations are quite satisfactory, and some of them tend to rationalise what may be nothing other than customs and prejudices surviving from the not easily understood past. In explaining the preference for boys over girls in contemporary societies, some have pointed to the higher earning potential of boys, and also to the possibility that parents may get more support from male children.[13] Here again, it is very hard to be sure that we have anything like a good explanation of the terrible inequities observed in gender relations.

It is important, I think, to distinguish between the *origin* of gender bias, and its *continued survival*. It is very hard to speculate about the origins of a phenomenon like this when it has gone on, it appears, for many thousands of years. However, the continued survival of this bias is more discussable. In this context, in my own attempt to understand these phenomena, I have tried to take note of both (1) the social influences of established conventions and prejudices, and (2) the economic influences of disparate opportunities that men have *vis-à-vis* women, especially given the way society is currently organised.[14] The importance of cooperation to make a success of family living (an efficiency-based argument) can be used in a situation of social asymmetry and prejudice to make women cooperate in very unequal terms (with great inequity). This is a general problem that applies even in Europe and North America in a variety of fields (such as division of family chores, the provision of support for higher training, and so on), but in poorer countries, the disadvantage of women may even apply to the basic fields of health care, nutritional support, and elementary education. The neglect of girls and female infants can be, in general, related to the lower social status of women.[15]

From a policy point of view, what has to be examined is not just the genesis of the anti-female bias, but the possible influences that can help to change the situation. A big difference, it appears, is made by the spread of education, especially female education. In the historical change of the standing and station of women in Europe, the spread of education did play, it appears, a

[13] See, for example, Rosenzweig and Schultz (1982).

[14] I have discussed this subject in Sen (1990).

[15] Other lines of explanation are also possible, some of which are discussed in Drèze and Sen (1989), Chapter 4; see also the extensive literature cited there.

major part. Another factor is women's economic independence, which depends both on the nature of property rights, and on the opportunities for remunerative employment open to women. A further factor is the property rights of women (including land ownership). Mortality statistics related to gender differences suggest the need to examine and scrutinise these different relations.

7. Public Policy Possibilities: The Case of Kerala

An extremely important case to examine in this context is that of the state of Kerala in India. It is a sizeable state, with 29 million people (rather more than in Canada), and its experience should not be dismissed as being numerically unimportant, just because it is a state within a large country, rather than a country on its own (the Kerala population is, in fact, larger than those of most countries in the world). As is seen in Fig. 4, the female-male ratio in Kerala is 1.04 (rather like what we see in Europe and North America—in fact higher than the 'standard' provided by sub-Saharan Africa), and there are really no 'missing women' there in the sense defined.[16] And yet the level of per-capita GNP or GDP is not particularly high in Kerala. In fact, the gross domestic product of Kerala is *lower* than the very low average for India as a whole. There is an economic and social question here of very great interest, which is captured by the statistics of mortality and survival, and this takes us well beyond the picture of achievement in terms of standard economic variables, such as GNP or GDP per head.

Various lines of explanation of the absence of gender bias in Kerala have been discussed in the literature.[17] It is plausible to argue that Kerala's success relates to its high level of basic education. Literacy among all adult women is around 86%, and that among young adult women is close to 100%.[18] It has a high ratio of women's employment in responsible and remunerative jobs. Furthermore, a part of the Kerala community—the caste of the Nairs—have had matrilineal inheritance of property for a long time.[19] Also the politics of Kerala has had a strong dose of radicalism for a long time, with a direct impact on this subject. The educational movement in Kerala has also been much helped by the activism of left-wing politics (the communist movement, which has been strong in Kerala, has been more pro-education than elsewhere in

[16] On this see also Klasen (1994).

[17] See, for example, Drèze and Sen (1989), and also Sen (1992*b*; 1994) and the literature cited there.

[18] Interestingly enough, the most spectacular move towards widespread education, including female education, was initiated by the ruling monarch of the native kingdom of Travancore, a very young queen, called Rani Gouri Parvathi Bai, who made a great pronouncement in 1816, outlining a programme of public education. Kerala benefitted, in this respect, from being outside the British empire, since the local monarchs of both Travancore and Cochin, which make up the bulk of today's Kerala, were very pro-education.

[19] The fact that Kerala had been open to international contact for a long time may also have been important in this. There have been Christians in Kerala at least since the 4th century (well before there were any in England); Jews have lived there since shortly after the fall of Jerusalem; and Arab traders have been visiting over a millennium. Kerala has also benefitted from the activities of missionaries (about one in five people in Kerala is Christian).

India).[20] These different lines of explanation—with their respective policy interests—are brought forward for consideration by the nature of the distinguished mortality statistics from Kerala.[21]

Kerala's experience suggests that 'gender bias' against females can be radically changed by public action—involving both the government and the public itself—especially through female education, opportunities for women to have responsible jobs, women's legal rights on property, and by enlightened egalitarian politics. Correspondingly, the problem of 'missing women' can also be largely solved through social policy and political radicalism. Women's movements can play a very important part in bringing about this type of change, and in making the political process in poor countries pay serious attention to the deep inequalities from which women suffer. It is also interesting to note, in this context, that the narrowly economic variables, such as GNP or GDP per head, on which so much of standard development economics concentrates give a very misleading picture of economic and social progress.

8. Mortality Statistics and Racial Inequalities

Data on morality and survival can also be used to raise pointed questions on the nature and reach of inequality between racial groups, for example in the United States. The extent of the deprivation of African Americans in the United States can come as a surprise especially to those who tend to concentrate mainly on economic data such as per capita income. Fig. 5 shows the frequencies of survival, up to different specified ages, of (1) African-American males (that is, of US black men), and (2) the male residents of Harlem (a largely 'black area' in Manhattan), compared with those not only of the US White, but also of the residents of China, Kerala, and even Bangladesh (in the 1980s). It is not surprising that the survival chances are much worse for African-Americans in general, and for the Harlem residents in particular, compared with the US White population, but both groups fall behind the corresponding population of China and Kerala soon enough. The Harlem men are overtaken in terms of survival even by the famished Bangladeshis. While the high levels of infant and child mortality make the probabilities of survival worse for Bangladesh initially, Harlem's higher age-specific mortality rates make the cumulative survival chances sink below those of Bangladeshi men by the age group of the late thirties. In contrast, any comparison with

[20] On this see Ramachandran (1997).

[21] The better relative position and power of women is thought to have been influential in bringing about a lowering of Kerala's fertility rate: a 'total fertility rate' of about 1.8, well below the replacement level, and also lower than China's 2.0 (without any attempt at coercion, as in China 'one child family' and related policy measures), and lower than the fertility rates of, say, the United States and Sweden (both around 2.1). The importance of the agency role of women in reducing fertility rate is fairly well supported in the development literature, though questions on this has been raised in recent studies; see the collection of papers in Jeffery and Basu (1997). On the basis of inter-district comparisons within India, Murthi, Guio and Drèze (1995) provide quite definitive evidence of the very large impact of female literacy in reducing fertility as well as child mortality. Female participation in outside work (and the related economic independence) also figure among the biggest influences in fertility reduction. See also Drèze and Sen (1995, 1997).

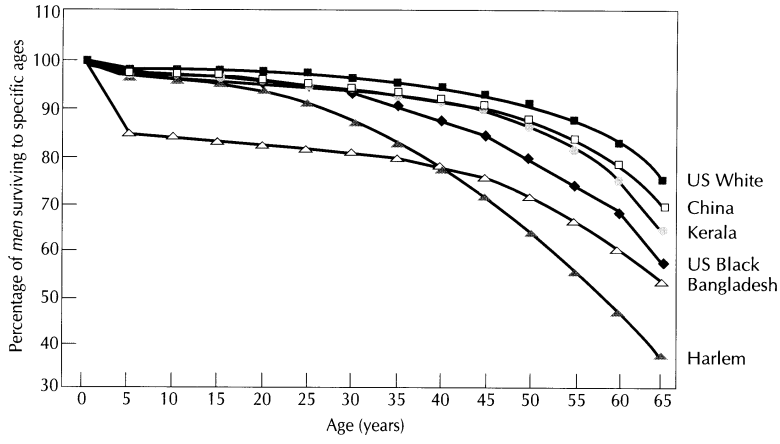

Fig. 5. *Variations in male survival rates by sex and region.*
Source: Sen (1993*a*), which also explains the data sources.

income per head shows the Harlem residents to be a great many times richer than the Bangladeshis (also the Chinese and the Kerala population).

Fig. 6 presents similar comparisons for females. Here Harlem does better than Bangladesh, though much worse than the US Whites, and also the people of China and Kerala. Harlem's edge over Bangladesh is closely related to the latter's high female infant and child mortality rates (an aspect of the phenomenon of gender bias, which was discussed earlier). The gap between women of Harlem and of Bangladesh steadily narrows as we move to higher age groups. Harlem residents fall behind the people of Kerala and China soon enough, and so do US blacks in general eventually.[22]

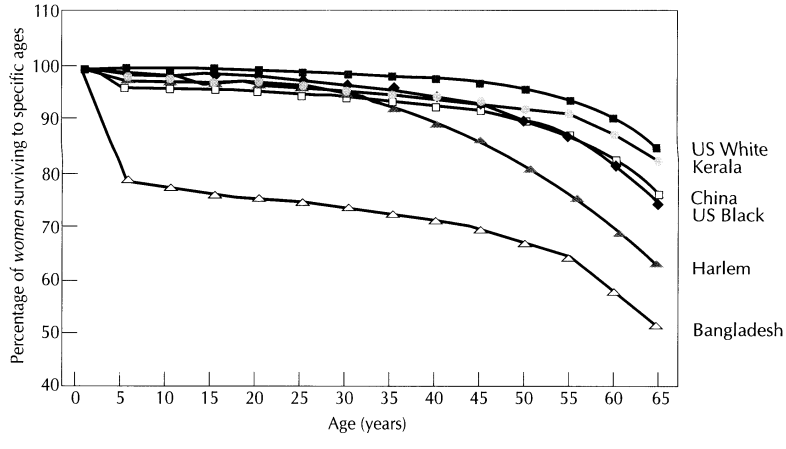

Fig. 6. *Variations in female survival rates by sex and region.*
Source: as Fig. 5.

[22] Kerala, incidentally, stays ahead of China in terms of survival rates for women (though the ordering is the other way round for men), and this again relates to the already discussed phenomenon of the absence of gender bias in Kerala.

The residents of Harlem combine the disadvantages of race with special problems of inner city deprivation. While it is still remarkable that their survival chances fall behind those of Bangladeshi men, it is perhaps more surprising that the US black population, *in general*, have lower chances of reaching a mature age than do the immensely poorer people—women as well as men—in Kerala or China. In terms of chances of survival to a ripe old age, an aspect of race-based deprivation is identified here that is missed completely in analyses based only on income data.

Figs. 5 and 6 indicate that the deprivation is particularly serious for *males* in Harlem and for US black males generally. The higher risk of death from violence of young black men is a factor that is much discussed in this context. But it would be wrong to presume that the inequality between blacks and whites is stronger among men *in general* compared with women, in the United States. Fig. 7 presents the ratios of the mortality rates of blacks and whites for the country as a whole (based on a sample survey). While US black men have 1.8 times the mortality rate of whites, black women have nearly three times the mortality of white women. It is also important to note that adjusted for differences in family income, while the mortality rate is 1.2 times higher for black men, it is as much as 2.2 times larger for black women. It, thus, appears that even after full note is taken of income levels, black women die in very much larger proportions (in child birth and in other ways) than white women in contemporary United States.

Comparisons of this kind, based on mortality date, are important because of the light they throw on existing inequalities in life chances. They are also important for the questions they raise about policy issues. If the relative deprivation of blacks transcends income differentials so robustly, the remedying of this inequality has to involve policy matters that go well beyond just creating income opportunities for the black population. It is necessary to address such matters as public health services, educational facilities, hazards of urban life, and other social and economic parameters that influence survival chances. The picture of mortality differentials presents an entry into the problem of racial inequality in the United States that would be wholly missed if our economic analysis were to be confined only to traditional economic variables.

9. Why Not Morbidity rather than Mortality?

In arguing for the case for much wider use of mortality statistics in economic analyses, we have to consider its relative advantages not only over traditional economic variables such as income, but also over health data which could appear to be an even more promising informational source about well-being than death statistics. It is natural to think that it may be better to look at *morbidity* rather than mortality since the suffering of people relates to illness, and once dead, there is—we presume—no further agony (even though I don't have to remind Florentines that Alighieri Dante would not have quite agreed with this).

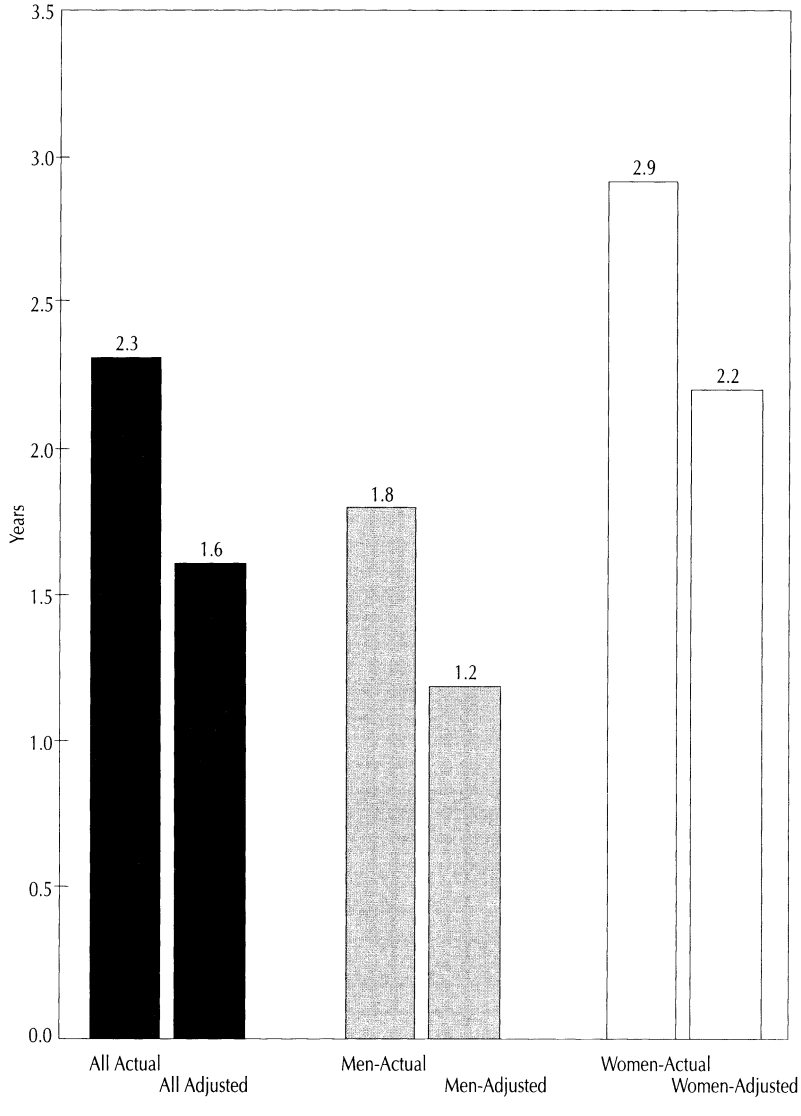

Fig. 7. *Mortality rate ratios of blacks/whites (aged 35–54) actual and adjusted for family income. Source:* Owen (1990).

There can be no question whatever that good information on morbidity would be extremely useful. The trouble, however, is that morbidity data—gathered through questionnaires—tend to suffer from major biases. People's *perception* of illness varies with what they are used to, and also with their medical knowledge. In places where medical care is widespread and good, people often have a *higher* perception of morbidity, even though they may be in much better general health. Receiving medical diagnosis and care tends to reduce actual morbidity, and at the same time, it increases one's understanding of illness (including knowledge of one's ailments). In contrast, a population that has

little experience of medical care, and which has widespread health problem as a standard condition of existence, can have a very low perception of being medically ill.

Fig. 8 presents the comparative rates of perceived morbidity in the United States and in India as a whole, and also in two Indian states: Kerala (a state with much education and health care—discussed earlier), and Bihar (a very backward state with much illiteracy and lack of medical facilities). It turns out that the rate of reported morbidity is much higher in Kerala than in India as a whole (despite all the medical care and high life expectancy in Kerala), and much lower in Bihar than the Indian average (despite the medical backwardness and low life expectancy in Bihar). Indeed Kerala, which has by a long margin the highest longevity among the Indian states, also has incomparably the largest rate of reported morbidity. At the other end, the states in the northern block in India (Bihar, Uttar Pradesh, Madhya Pradesh, Rajasthan) have much the lowest longevity and also much the least reporting of morbidity.

This apparent perversity persists in international comparisons with the United States as well. Indeed, as Fig. 8 indicates, the United States has even *higher* rates of reported morbidity than Kerala.[23] Once again, high life expectancy and high levels of reported morbidity move together—not in opposite directions.

These observations relate to a general methodological question, that of 'positional objectivity', which I have tried to discuss elsewhere.[24] The objectiv-

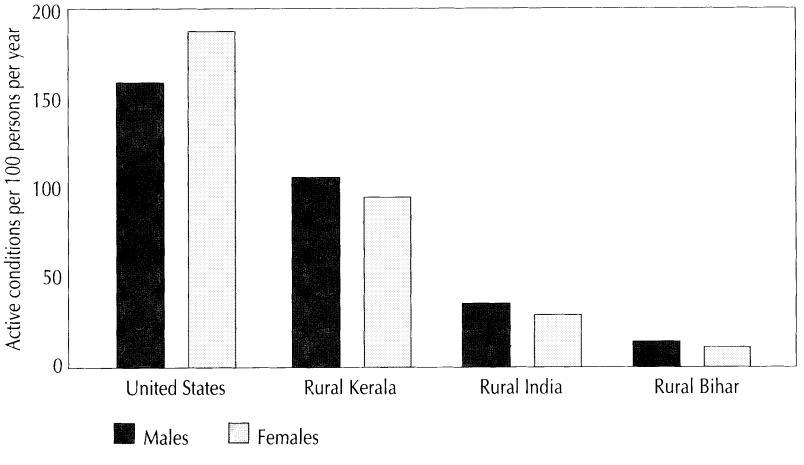

Fig. 8. *Incidence of reported morbidity: United States, rural Kerala, rural India and rural Bihar. Source:* For the United States: NCHS (1986), National Sample Survey 1974. The Indian data are from National Sample Surveys, and have been processed in this form by Chen and Murray (1992).

[23] The comparison with the United States is based on surveys of the same diseases; on that see Chen and Murray (1992).

[24] The problem is discussed in Sen (1993*b*); see also 'Objectivity and Position: Assessment of Health and Well-being', in Chen and Kleinman (1994).

ity of positional observations plays a crucial part in the process of acquiring knowledge, and thus serves as the building block of our understandings and perceptions. When we observe the world, including ourselves, what we discern and appreciate is strongly influenced by what else we know and what other experiences we have. Our observational analyses from particular 'positions' can be 'objective' enough from that position, and yet very far from what we could know had we been differently placed.

The morbidity information that is obtained from our own perceptions of illnesses and ailments is mediated through our positional understandings and interpretations. When a community has few health facilities and little general and medical education, the perception of ill health can be very limited, and knowledge of specific ailments may be particularly lacking. And yet the members of that community may have a good deal of illness in terms of more general medical criteria. When high mortality rates go with low perceptions of morbidity, the case for questioning the morbidity data is indeed strong.[25] We may get a much better idea of people's ability to avoid death and severe illness by looking at actual mortality information, rather than from self-perception of ailments.[26]

Even when the morbidity data are not based on subjective assessment, but on the actual care of the ill, that again tends to reflect the availability of medical care (lower in Bihar than in Kerala, which is lower than in the United States, and so on). If a village acquires a hospital, more people are treated, and thus more statistics becomes available about how many people are ill and are being treated. But that must not be seen as an increase in morbidity itself.

10. Sluggishness and Speed of Movement

Finally, I come to the argument that even if mortality is a sensible thing to look at for economic analyses, surely it is too *sluggish* a variable to be of much use as

[25] It has been pointed out that in the United States the higher self-perception of morbidity, despite lower mortality, may reflect the fact that people who survive early death frequently remain open to suffering from illnesses, and some of these conditions may require a good deal of medical attention and care. Thus, it could be argued that the medically recognised morbidity may not be so different after all from self-perception of morbidity. There is certainly a need to look at this aspect of the actual medical experiences of different societies, but it does not eliminate the difficulty of interpreting self-perceived morbidity when the understanding of illnesses vary widely (for example, with medical and educational facilities). Furthermore, while it is undoubtedly correct that a person who dies from an illness (rather than surviving it) needs less medical attention—indeed none—in the future, the seriousness of the illness in question that kills the person need not be lightly dismissed just because a finality of medical attention has been reached. In terms of the well-being of the population, the mortality information have dual relevance in that (1) they tell us about the misfortune of death, and (2) quite possibly serve as a reasonable signal of the presence of a significant illness (with negative features other than death, such as suffering and misery).

[26] In defending the use of self-perception of morbidity, it is sometimes pointed out that we may be as ill as we think we are, and it is hard to dispense with self-perception in understanding ailments; for a powerful philosophical defence of a similar position see Kleinman (1994). See also Kleinman (1986). There is force in this argument, but the point at issue is not that of *ignoring* the self-perception of illness, but of *interpreting* such information. In this interpretation, the positional features have to be considered. Mortality data help us *inter alia* to identify the positional characteristics and thus enrich the interpretation of self-perception of illnesses. They can be, of course, supplemented by direct medical observations of illness and undernourishment (on these issues, see also Osmani 1992 and Dasgupta 1993).

an economic indicator? Variables like national income or employment can move quite quickly and can thus serve as guides for policy change. In contrast, it is argued, mortality moves slowly, since it depends on many variables that are hard to change, including human constitution (the expanding of average life expectancy beyond the age group of 80s does not seem to be even on the card in the foreseeable future). This must be a drawback for the use of mortality statistics as an economic indicator.

This line of reasoning is defective for several distinct reasons. Perhaps the most immediate issue concerns the fact that mortality rates can shift very quickly indeed when it moves in an upward direction due to an economic crisis. Famines provide a class of examples in which the movement of mortality can be disastrously rapid, and they certainly do call for immediate economic response.[27] But there are also examples of other kind of economic and social change in which mortality rates have gone up extremely fast. The recent experience of the former Soviet Union and of Eastern Europe provide many such terribly distressing cases.

Fig. 9 presents the time series of crude death rates in Russia, with a sharp rise from 1989 and an extremely speedy escalation from 1992.[28] Life expectancy figures have also correspondingly fallen with great haste in these countries.[29] While the nature of the economic crises in these countries has received much attention lately, the mortality information point to aspects of the crises that other data may not bring out.[30] In particular, the rapid deterioration of the health service and medical facilities, the collapse of the general system of social security, and changes in social and physical environments are natural candidates for immediate investigation in this context.

To move to a different aspect of the speed issue, what is regarded as 'speedy' must depend on the space we consider and the normalisation we use. GNP growth rates look rapid enough, but if we consider speed by the rate at which international gaps can be narrowed, these may not be at all as fast as the movements of life expectancy figures that are actually observed.

In a striking and insightful passage, the basic issue was identified by Mahbub ul Haq (1963), then a leading economic planner in Pakistan:

> If India and Pakistan manage to maintain an annual growth rate of 5% and pass through roughly the same 'take-off' period as Rostow identifies for many of the Western countries, the per capita income after another twenty years will be no higher than the present-day per capita income in Egypt.[31]

While that recognition of 'slowness' in moving per capita income has not

[27] I have tried to discuss the policy issues in famine prevention in Sen (1981), and Drèze and Sen (1989).

[28] The chart is obtained from Fig. 2 in Cornia with Paniccià (1995). See also UNICEF (1994).

[29] See Ellman (1994).

[30] On this see Ellman (1994), and Cornia with Paniccià, (1995).

[31] Later, Haq would pioneer and develop the influential *Human Development Reports* from 1990 onwards for the UNDP. The need to shift the focus of attention from GNP growth rates can already be seen in Mahbub ul Haq's insightful observation more than three decades earlier.

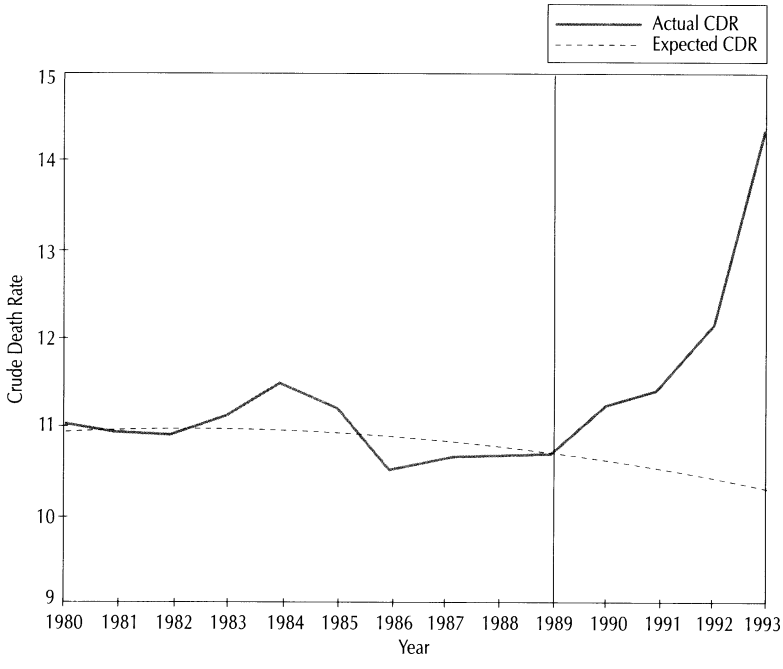

Fig. 9. *Actual and expected crude death rate in Russia, 1980–93.*
Source: Cornia with Paniccià (1995).

changed, in matters of life and death, many developing countries have made great and—in the relative scale—extraordinarily rapid progress. Almost all the poor countries today have higher life expectancy than most of the richer countries had not long ago.[32] Considerations of speed do not give us ground for moving away from our basic interest in matters of life and death.

11. Concluding Remarks

I shall not try to summarise this lecture, but will take this opportunity of pointing to a few features of the analysis that was presented. The basic focus was on showing why and how mortality statistics can be helpful in the formulation of economic policy decisions over a large field, covering overall performance as well as distributional concerns over class, gender and race.

I have argued that mortality information has (1) intrinsic importance (since a longer life is valued in itself), (2) enabling significance (since being alive is a necessary condition for our capabilities), and (3) associative relevance (since many other valuable achievements relate—negatively—to mortality rates).

It is not suggested that the use of more traditional economic variables should be abandoned in economic analysis in favour of relying on mortality

[32] Some have even come fairly close to contemporary European life expectancy, including, to name a few, Costa Rica, China, Sri Lanka, and Kerala, even though they have not got anywhere near the European per capita GNP.

information only. Rather, it is a question of supplementing that traditional informational approach by another outlook that can be epistemically rich and practically important. Personal income is certainly a basic determinant even of survival and death, and more generally of the quality of life of a person.

Nevertheless, income is only one variable among many that affect our chances of enjoying life, and some of the other variables are also influenceable by economic policy. Quality of life depends on various physical and social conditions, such as the epidemiological environment in which a person lives. The availability of health care and the nature of medical insurance—public as well as private—are among the important influences on life and death. So are the other social services, including basic education and the orderliness of urban living, and the access to modern medical knowledge in rural communities. The statistics on mortality draw our attention to all these policy issues.

Mortality information can throw light also on the nature of social inequalities, including gender bias and racial disparities. Biases in economic arrangements are often most clearly seen through differential mortality information.

While mortality statistics can be, in principle, well supplemented—and to some extent even supplanted—by morbidity information, the typical morbidity data are, for this purpose, very unreliable indeed. The objectivity they reflect is positionally contingent and can be hard to use for comparative purposes. Mortality statistics can some times give us a better idea of the level of health and illness of a population than the morbidity data gathered in the usual way.

Mortality data are not only informationally rich, they can also move fast enough to provide guidance on a rapidly changing economic and social situation. The recent experience of the former Soviet Union and Eastern Europe bring this out. These mortality shifts can draw attention to the need for policy change that cannot be presumed exclusively from the statistics of incomes and other standard economic variables. Furthermore, in terms of long-run comparisons, when the mortality and longevity data are relatively scaled, they can register more sensitivity than relative income levels provide.

Mortality statistics can form a major component of the informational base of economic analysis. I have tried to discuss and illustrate the nature and reach of that informational perspective.

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